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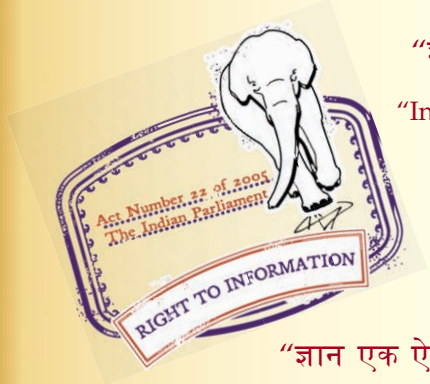

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Indian Standard

DIMENSIONS FOR STEEL TUBES FOR AUTOMOTIVE PURPOSES

(First Revision)

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NEW DELHI 110002

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Indian Standard

DIMENSIONS FOR STEEL TUBES FOR AUTOMOTIVE PURPOSES

(First Revision)

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Indian Standard

DIMENSIONS FOR STEEL TUBES FOR AUTOMOTIVE PURPOSES

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 26 February 1979, after the draft finalized by the Steel Tubes, Pipes and Fittings Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard was first published in 1969. On the basis of experience gained during these years, it has been decided to revise this standard.

0.3 Material specification and designations are covered in IS : 3074-1979*.

0.4 In the formulation of this standard, due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country. This has been met by deriving assistance from the following publications:

ISO/R 336-1976 Plain end steel tubes, welded or seamless. General table of dimensions and masses per unit length. International Organization for Standardization.

BS 980 : 1950 Steel tubes for automobile purposes. British Standards Institution.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Specification for steel tubes for automotive purposes (*first revision*).
†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard specifies dimensions of steel tubes used in automotives including scooters and motorcycles.

1.1.1 Outside diameters or thickness for shock absorber tubes are not specified in this standard. Purchasers are, however, recommended to ascertain from the manufacturers the sizes easily available before completing any design work which incorporates these tubes.

2. DIMENSIONS

2.1 The dimensions for steel tubes shall be as specified in Table 1.

2.1.1 Dimensions of tubes in this standard have been given in terms of outside diameter and the thickness of the tubes. Steel tubes for automotive purposes may also be ordered on the basis of inside diameter and thickness or to outside and inside diameters by special agreement between the purchaser and the manufacturer.

2.1.2 Dimensions of steel tubes specified in this standard are based on the usage of steel tubes in automobile industry. Requirement for the supply of steel tubes of special sizes, tolerances and finishes, etc, shall be subject to the agreement between the purchaser and the manufacturer.

3. TOLERANCES

3.1 Tolerance for Cold Drawn Seamless and Cold Drawn Electric Resistance Welded Steel Tubes — For cold drawn seamless (CDS) and cold drawn electric resistance welded steel tubes the following tolerances shall be permissible.

3.1.1 *Tolerances on Thickness*

a) *Tolerances on mean thickness* — No tube shall have a mean thickness that departs from the specified thickness by more than:
   1) ±0·08 mm for tubes up to and including 2·0 mm thick,
   2) ±0·1 mm for tubes above 2·0 mm thick up to and including 5·0 mm thick, and
   3) ±2 percent for tubes over 5·0 mm thick.

b) *Maximum variation in thickness in any one tube* — At no point in the tube shall the variation in thickness be greater than ±10 percent of the actual mean thickness of the tube.

3.1.2 *Tolerance on Mean Inside Diameter or Outside Diameter (Whichever is Specified)* — No tube shall have a mean inside or outside diameter that departs from the specified diameter by more than ±0·1 mm for tubes up to and including 38·0 mm diameter, with the addition, for larger tubes, of ±0·03 mm for each 13 mm or part thereof over 38·0 mm diameter.

TABLE 1 DIMENSIONS OF STEEL TUBES FOR AUTOMOTIVE PURPOSES

(*Clause* 2.1)

Outside Diameter × Thickness mm × mm	Outside Diameter × Thickness mm × mm
10·2 × 0·6	31·8 × 1·0
10·2 × 1·0	31·8 × 1·6
10·2 × 1·6	31·8 × 3·2
12·0 × 0·6	38·0 × 1·2
12·0 × 1·2	38·0 × 1·6
12·0 × 1·6	38·0 × 2·0
12·0 × 2·3	38·0 × 2·6
13·5 × 2·0	38·0 × 4·0
16·0 × 1·2	38·0 × 6·3
16·0 × 1·6	44·5 × 1·0
16·0 × 2·6	44·5 × 1·6
16·0 × 3·2	44·5 × 2·3
17·2 × 1·6	44·5 × 3·2
17·2 × 2·0	44·5 × 5·9
20·0 × 2·0	51·0 × 1·2
20·0 × 2·6	51·0 × 1·6
20·0 × 3·2	51·0 × 2·6
22·2 × 1·6	51·0 × 5·9
22·2 × 2·0	57·0 × 1·6
22·2 × 2·6	57·0 × 5·0
22·2 × 3·2	63·5 × 1·6
22·2 × 4·0	63·5 × 2·6
25·4 × 1·6	63·5 × 4·0
25·4 × 2·3	63·5 × 6·3
25·4 × 3·2	70·0 × 2·9
25·4 × 3·2	76·2 × 2·6
25·4 × 4·0	76·2 × 4·0
30·0 × 2·0	76·2 × 5·6
30·0 × 3·2	88·9 × 3·2
30·0 × 4·0	101·6 × 4·5
	101·6 × 10·0

3.1.3 *Maximum Variation in Diameter in any One Tube* — At no point in the tube shall the variation in outside diameter or inside diameter (whichever is specified) be greater than the value given below:

either

$\pm 0{\cdot}05$ mm greater than the tolerance on the mean diameter

or

$$\pm\left[0{\cdot}13 \text{ mm} + \frac{D^3}{(1000t)^2}\right] \text{ mm, whichever is greater}$$

where

D = specified outside diameter of the tube in mm, and

t = specified thickness of the tube in mm.

(The D^3 formula shall not apply to tubes where the $D:t$ ratio is less than 40 : 1).

The limitations on extreme outside diameter or inside diameter are based on the specified diameter, that is, at no point in the tube shall the lowest reading of the diameter be less than the specified diameter minus the above tolerance, and the highest reading shall not be more than the specified diameter plus the above tolerance. The mean diameter shall be within the limits of the specified diameter plus and minus the tolerance on the mean diameter.

3.2 Tolerance for Electric Resistance Welded (ERW) Steel Tubes — For electric resistance welded (ERW) steel tubes, tolerances on dimensions shall be as given below.

3.2.1 *Tolerance on Thickness (Excluding Weld)* — ± 8 percent. The height of the internal fin shall be not greater than 60 percent of the specified wall thickness.

3.2.2 The internal welding bead shall be removed if so specified by the purchaser.

3.2.3 *Tolerance on Mean Outside Diameter* — The tolerance on mean outside diameter shall be as follows:

Outside Diameter of Tube		*Tolerance*
Over	Up to and Including	±
mm	mm	mm
—	25	0·10
25	51	0·13
51	63	0·18
63	76	0·20
76	88	0·25
88	—	0·30

3.2.4 *Maximum Variation in Diameter in Any One Tube* — At no point in the tube shall the variation in outside diameter greater than two values given below:

either

±0·05 mm greater than the tolerance on the mean diameter

or

$$\pm\left[0{\cdot}13 \text{ mm} + \frac{D^3}{(1\,000\,t)^2}\right] \text{mm, whichever is greater}$$

where

D = specified outside diameter of the tube in mm, and

t = specified thickness of the tube in mm.

(The D^3 formula shall not apply to tubes where the $D:t$ ratio is less than 40 : 1).

The limitations on extreme outside diameter or inside diameter are based on the specified diameter, that is, at no point in the tube shall the lowest reading of the diameter be less than the specified diameter minus the tolerance, and the highest reading shall be not more than the specified diameter plus the tolerance on mean diameter.

NOTE — ' Mean ' as used above is defined as half the sum of the maximum and minimum values.

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